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ABSTRACT

Subject choice by students in year 12 in Australian secondary schools was examined by using data on the 1995 cohort participating in the Longitudinal Surveys of Australian Youth project. The seven broad categories of English, mathematics, humanities and social sciences, economics and business, biological and physical sciences, and the arts accounted for some 75% of subject enrollments, with an increasing share of enrollments being taken up by technical studies and computer studies (in which enrollments were respectively 3.6% and 3.7% higher than in 1993). In all other subject areas except English, enrollments have decreased since 1993. Students' state of residence, gender, and earlier school achievement in literacy and numeracy proved three of the most important influences on subject choice by year 12. As in 1990 and 1993, males predominated in mathematics, physical science, technical studies, computer studies, and physical education, with females predominating in the other broad subject areas. Participation in vocational education and training (VET) was greater among those students who were from lower socioeconomic backgrounds, who had lower levels of earlier school achievement, and who were of English speaking background. VET participation was also greater among students from government and Catholic schools than from independent or rural schools. (Contains 31 tables and 10 references.) (MN)

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Longitudinal Surveys of Australian Youth

Research Report Number 15

Subject Choice by Students in Year 12 in Australian Secondary Schools

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- Marks, G. & Ainley, J. *Reading Comprehension and Numeracy among Junior Secondary School Students in Australia* (LSAY Research Report No. 3). Melbourne: ACER, March 1997.
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- Fullarton, S. *Work Experience and Work Placements in Secondary School Education.* (LSAY Research Report No. 10). Melbourne: ACER, June 1999.
- Marks, G. & Fleming, N. *Early School Leaving in Australia: Findings from the 1995 Year 9 LSAY Cohort.* (LSAY Research Report No. 11). Melbourne: ACER, August 1999.
- Lamb, S. & Ball, K. *Curriculum and Careers: the education and labour market consequences of Year 12 subject choice* (LSAY Research Report No. 12). Melbourne: ACER, September 1999.
- Long, M., Carpenter, P. & Hayden, M. *Participation in Education and Training 1980 – 1994.* (LSAY Research Report No. 13). Melbourne: ACER, September 1999.
- Lamb, S. & Rumberger, R. *The Initial Work and Education Experiences of Early School Leavers: A comparative study of Australia and the United States.* (LSAY Research Report No. 14). Melbourne: ACER, December 1999.
- Fullarton, S. and Ainley, J. *Subject Choice by Students in Year 12 in Australian Secondary Schools.* (LSAY Research Report No. 15). Melbourne: ACER, June 2000.

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Longitudinal Surveys of Australian Youth

Research Report Number 15

SUBJECT CHOICE BY STUDENTS IN YEAR 12 IN AUSTRALIAN SECONDARY SCHOOLS

Sue Fullarton
John Ainley

This report forms part of the Longitudinal Surveys of Australian Youth: a research program jointly managed by ACER and the Commonwealth Department of Education, Training and Youth Affairs.

The views expressed in this report are those of the authors and not necessarily of the Commonwealth Department of Education, Training and Youth Affairs.

June 2000

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EXECUTIVE SUMMARY

The diverse range of students who now stay to complete secondary school have a wide range of choices available to them in their selection of subjects. Year 12 students in Australia are not only diverse in their social and economic backgrounds but in their previous achievements, interests and aspirations. For these reasons it is important to monitor the nature of the curriculum that students experience. It is important to ensure that students experience a senior secondary curriculum that provides them with the knowledge and skills on which to base fulfilling personal lives, successful labour market outcomes and the opportunity to contribute to the well-being of the society in which they live.

Choices that are made in the subjects studied in senior secondary school influence differences in access to higher education, vocational education and training, and to labour market outcomes. Previous studies have shown that students from higher socioeconomic backgrounds, those from private schools, high early school achievers and students from non-English speaking backgrounds are more likely to participate in the courses that are avenues to higher education and the professions. Students from disadvantaged backgrounds tend to participate in courses that lead to vocational education and training or more often to entry into the labour market without any further formal education or training. Hence there are compelling reasons concerned with equity, as well as effectiveness, for monitoring patterns of subject choice among students in Year 12.

This report uses data from the 1995 cohort participating in the Longitudinal Surveys of Australian Youth (LSAY) project, particularly the 1998 data on Year 12 subject choice and the 1995 data relating to student demographics and achievement in literacy and numeracy. It examines patterns of subject enrolments in Year 12 in Australian schools, and the relationship of those patterns to characteristics such as gender, socioeconomic background, ethnic background, location of school, school system, and earlier school achievement. Enrolments are measured by both participation rates and by enrolment indices, which are a weighted percentage of the enrolments in an area of study, and represent curriculum share for the particular subject.

Typically, Australian students study between four and six subjects in Year 12. Almost all study an English subject, and almost 90 per cent study at least one mathematics subject. The next highest participation rates are for the biological and other sciences (43 per cent) and humanities and social sciences (40 per cent). Just over one-quarter (28 per cent) of students study a physical science.

Since the subject choice report in 1994, enrolments in English and Mathematics have remained reasonably stable. In general, subject enrolments in Studies of Society and Environment have declined, with the exception of business studies. In the Sciences, there has been an increase in the proportion of students enrolled in general science subjects. Enrolments in the Arts and Languages other than English have remained reasonably stable, while in the Technology area, enrolments in computer studies, technical studies and food and catering have increased substantially while those in home economics have declined. In Health and Physical Education, enrolments in health have increased.

Gender was found to be one of the student characteristics accounting for the greatest proportion of variation in student enrolments. As found in previous subject choice reports, males predominate in the areas of Mathematics, particularly in higher level mathematics, physical sciences, technical studies, computer studies and physical education. Females predominate in the areas of English, humanities and social sciences, biological sciences, the arts, languages other than English, home sciences and health studies.

Enrolments in Mathematics, and more particularly in the physical sciences, were found to be influenced by socioeconomic background as measured both by parents' occupations and by parents' educational levels. Enrolments were consistently higher in these subject areas for students from the higher socioeconomic background. Enrolments for the Technology Key Learning Area were consistently higher for those students from a lower socioeconomic background.

Since the 1994 study of subject choice there has been a substantial increase in the proportion of students undertaking Vocational Education and Training (VET) subjects as part of their studies. According to this survey, approximately 16 per cent (about one in six) of Year 12 students in Australia indicated at least one VET subject as part of their program. Participation was greater for those from a lower socioeconomic background (19.3 per cent compared to 8.7 per cent for those from the highest socioeconomic levels), for those with parents with lower levels of education and those with lower levels of early school achievement in literacy and numeracy. Students from a non-English speaking background were not as likely to participate in VET, nor were students from independent schools or students in capital cities.

Subject Choice by Students in Year 12 in Australian Secondary Schools

INTRODUCTION

The subjects chosen and studied in the senior secondary years have a major influence upon the educational and career options available to young people when they leave school. This choice of subjects has been seen as involving issues about equity between various social groups (Oakes, 1990). Multi-level analysis of curriculum choice and educational outcomes, as well as analyses examining patterns of course enrolment (Lamb & Ainley, 1999; Lamb & Ball, 1999) have demonstrated that senior school subject choice leads to differences in access to higher education, vocational education and training, and to labour market outcomes. Students from higher socioeconomic backgrounds, high early school achievers and students from non-English speaking backgrounds are more likely to participate in the courses that are avenues to higher education and the professions. Students from disadvantaged backgrounds tend to participate in courses that lead to vocational education and training or more often to entry into the labour market without any further formal education or training. Findings from the analysis conducted by Lamb & Ball (1999) suggest that while the senior school curriculum operates to transmit the effects of student background and prior achievement, it also has an independent influence, and that student course taking is a strong predictor of post-school outcomes. Students exercise considerable choice in the subjects which they study, and therefore in the curriculum which they experience over those years. Information about patterns of subject choice by senior students can make an important contribution to the monitoring of changes in education systems. This report on Subject Choice in Year 12 describes patterns of subject enrolments by students in the final year of secondary school and the relationship of those patterns with a range of educational, personal, social, and school characteristics. Similar studies of subject choice were conducted in 1990 and 1994. This report uses corresponding measures of participation in subject areas to those used in previous studies. Consequently information can be compared with those earlier patterns so as to inform discussion about possible changes since then, as well as current patterns. Another report in this series (Lamb & Ball, 1999) examines patterns of course enrolments in Year 12, where courses are defined as the clusters of subjects studied by individual students.

Since the 1994 study of subject choice there has been substantial growth in participation by senior secondary school students in vocational education and training (VET) studies. Even though these studies are taken in a variety of locations, they constitute a formal part of many Year 12 programs. The recent rapid growth in participation in VET makes it imperative to understand who studies those subjects and in which schools. Longitudinal data from a nationally representative sample can provide an important perspective on participation in VET by secondary school students. This report uses longitudinal data to provide a national picture of participation in VET subjects.

Sample

A national stratified sample of students who were in Year 9 at school was established in 1995. The sample design was intended to initially provide a sample of approximately 10 000 young people. These students were interviewed by telephone in 1996, 1997, and 1998, when most were undertaking Year 12, the final year of secondary schooling.

Table 1 Sample details, Year 12 students, LSAY: Y95 data

State/Territory		Per cent population	Sample	Weighted Sample
NSW	Government	20.87	1077	1565
	Catholic	7.63	390	572
	Independent	3.52	197	264
Vic	Government	15.22	1020	1141
	Catholic	6.59	395	494
	Independent	4.43	276	332
Qld	Government	11.27	895	845
	Catholic	4.00	263	300
	Independent	3.55	225	266
SA	Government	5.29	605	397
	Catholic	1.61	173	121
	Independent	1.24	281	93
WA	Government	6.21	570	466
	Catholic	2.37	174	178
	Independent	1.56	232	117
Tas	Government	1.08	104	81
	Catholic	0.47	84	35
	Independent	0.49	85	37
NT	Government	0.32	104	24
	Catholic	0.09	21	7
	Independent	0.11	21	8
ACT	Government	1.12	186	84
	Catholic	0.61	120	46
	Independent	0.33	43	25

The major stratum considered in the design was state of schooling. Students from smaller states were over-sampled and, correspondingly, students from larger states were under-sampled. Selection of students within states was proportional by sector. Three sectors were used as strata: government schools, Catholic schools and non-government, non-Catholic (referred to as *independent*) schools. Within strata, schools were selected with a probability proportional to their size, with an implicit stratification by geography because of the postcode-order of the sampling frame. Weights based on actual numbers of respondents in comparison with official enrolment figures were used to calculate results representing the populations from which the samples were drawn. Details of the samples are shown in Table 1.

Variables used as Indicators of Subject Choice

Two indicators of subject choice were computed from the survey data: participation rates and enrolment indices.

Participation rates

Participation rates in individual subjects, and groups of subjects are the percentages of Year 12 students taking that subject or at least one subject from a group of subjects. For this study participation rates based on numbers in the cohort from Year 9 were not used.

Enrolment indices

Enrolment indices for subject areas and *Key Learning Areas* (KLAs) are the enrolments in an area expressed as a weighted percentage of all enrolments (in full-time equivalent subjects). Values of enrolment index are additive across areas and sum to 100 for any student or group of students. Another way of thinking about enrolment indices is to consider them as *curriculum share;* a concept that can be envisioned as applying to the program of an individual student or across a group of students.

Variables used to Examine Subject Choice

One purpose of this study was to examine the ways in which enrolments in subject areas related to various characteristics of Year 12 students, their background, and the school that they attended. Previous reports (Ainley, Jones & Navaratnam, 1990; Ainely, Harvey-Beavis, Elsworth & Fleming, 1994; Lamb & Ainley, 1999) have indicated that there are a number of ways in which social and school factors shape curriculum enrolment patterns. In general, these studies show that students from higher socioeconomic backgrounds, those from private schools, high early school achievers and students from non-English speaking backgrounds are more likely to enrol in courses with stronger links to university entry, and thus to professional jobs. Other research has shown that students from lower socioeconomic levels are more likely to take courses associated with Vocational Education and Training (Lamb, Long & Malley, 1998).

Variables such as gender and state are self-explanatory; however some of the other variables used need to be defined.

- **Earlier school achievement** Data from the 1995 Year 9 cohort of LSAY includes scores on a test of reading comprehension and a test of numeracy. These tests are included in the LSAY so as to be able to investigate how earlier school achievement affects subsequent patterns of participation in education and training as well as educational and labour market outcomes. Each test consisted of 20 items and was of high reliability (the measure of internal consistency (KR20) was in excess of 0.8 for each test). Combining the standardised scores for each test we can derive an overall measure of achievement. The tests included many items used in previous national studies of literacy and numeracy in 1975 and 1980.

- **Socioeconomic background** Respondents to the LSAY surveys indicated which of a list of ten occupational categories (with a number of examples) was closest to the present occupation of their mother and their father. Socioeconomic status was assigned as the most prestigious of the two, according to the ANU scale of occupational prestige (Broom, Duncan-Jones, Jones & McDonald, 1977). For

reporting purposes it was collapsed into four categories: low (unskilled or semi-skilled), lower middle (trades, clerical and sales), upper middle (para professional, small business) and high (professional).

- **Parental education** A measure of parents' educational levels was obtained from student responses to a question on the survey that asked them to indicate the highest education level of their mother and their father. The six possible response categories ranged from 'primary school only' to 'completed a university (or equivalent) diploma/degree'. In the report the categories have been collapsed to three: mid-secondary school or less, completed secondary school or TAFE qualification, and having completed some form of higher education.

- **Ethnic background** Two different approaches were initially used to examine the ethnic background of the student. One was based on parental birthplace and the other on language spoken at home. As there have not been found to be large differences between the effects of these two variables on student achievement, parental birthplace will be used as the indicator of ethnic background. For the purposes of this report parental background was classified as Australian/English (students with both parents born in Australia or overseas English speaking countries) or non-English (one or both parents from a non-English speaking country).

- **School system** School system refers to the type of secondary school students attended at the time of the survey, and is classified as government, Catholic, or non-Catholic independent.

- **Location** Location refers to where the student lived, and is classified as capital city, a provincial city (of more than 25 000 people), and a country town (1 000 – 25 000 people) or other country area.

Table 2 Number of full-time equivalent subjects studied by Year 12 students[a] in 1998

State/Territory	Number of Subjects
New South Wales	5.6
Victoria	5.0
Queensland	6.0
South Australia	5.1
Western Australia	5.7
Tasmania	4.3
Northern Territory	4.9
Australian Capital Territory	5.0
Australia	5.4

a N = 7 541 (unweighted), N = 5 010 (weighted)

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SUBJECT AREA ENROLMENTS FROM A NATIONAL PERSPECTIVE

Numbers of Subjects taken in Year 12

Typically, students in Year 12 study five (47 per cent of students) or six (38 per cent of students) subjects. Nationally the average was 5.4 subjects, and while there are some state variations that can be seen in Table 2, students in most states study between five and six subjects. The exceptions to this are in Queensland where around 70 per cent of students study six subjects, and in Tasmania where around 40 per cent of students study only four subjects. These apparent anomalies, however, do not reflect actual differences in overall workload or teaching time. Where the average number of full-year equivalent subjects is fewer it usually corresponds to those subjects having more teaching time per week. Where the number is greater each subject usually has proportionally less instructional time than in those states where students generally take five subjects.

Table 3 Key Learning Areas and Subjects, 1998

Key Learning Area	Subject Area	Subject Examples
English	English	English, ESL, Literature
Mathematics	Mathematics	General Mathematics, Further Mathematics, Specialist Mathematics, Mathematics A, Mathematics B, Mathematics 1, Mathematics 2, Business Mathematics
Society and Environment	Humanities & Social Sciences	Geography, History, Society & Culture, General Studies, Sociology
	Economics & Business	Accounting, Economics, Legal Studies, Business Studies, Secretarial Studies, Tourism
	Religion	Studies of Religion
Science	Biological & other sciences	Biology, Psychology, Environmental Studies, Geology
	Physical sciences	Chemistry, Physics
Arts	Arts	Art, Music, Dance, Drama, Theatre Studies, Graphic Communication, Media Studies
LOTE	LOTE	French, German, Italian, Japanese, Chinese, Indonesian
Technology	Computer Studies	Information Technology, Computing Studies, Information Processing & Management
	Technical Studies	Materials & Technology, Design & Technology, Technology Studies, Textiles and Design, Graphics
	Home science	Home Economics, Human Development, Child Care/Child Studies, Food Studies
	Agriculture	Agricultural Science, Agriculture & Horticulture, Agriculture
Health & Physical Education	Physical Education	Physical Education, Outdoor Education, Sport
	Health	Health Education/Studies, Personal Development, Life Management Studies
Not Classified		Subjects or units that were not able to be classified by the interviewers into the categories listed above

There was little difference in the number of subjects studied by students in the three school systems. As has been seen in previous reports, students in Catholic schools studied on average 5.7 subjects, while their counterparts at both government and independent schools studied on average 5.4 subjects. A major reason for this appears to be the additional studies in religion undertaken by students in Catholic schools.

Participation Rates in Subjects and Subject Areas

To analyse enrolment patterns, individual subjects were classified into 15 broad subject areas, with a small residual "not classified' category. These subject areas in turn were then grouped into eight Key Learning Areas. Table 3 provides some examples of how subjects are grouped into subject areas and then into Key Learning Areas.

Figure 1 shows the percentage of students taking no subjects in an area, the percentage taking up to the equivalent of one full time subject from an area, and the percentage taking more than one subject from each of the eight Key Learning Areas. Table 4 records the pattern of enrolments for Year 12 students nationally in these Key Learning Areas and in their constituent subjects. Table 5 records the participation rates for common subjects, or groups of closely related subjects, across Australia.

English

It can be seen from Table 4 that taking an English subject was almost, but not quite, universal. An English subject was studied by 93 per cent of all Year 12 students, including some 4 per cent who were studying more than one subject.

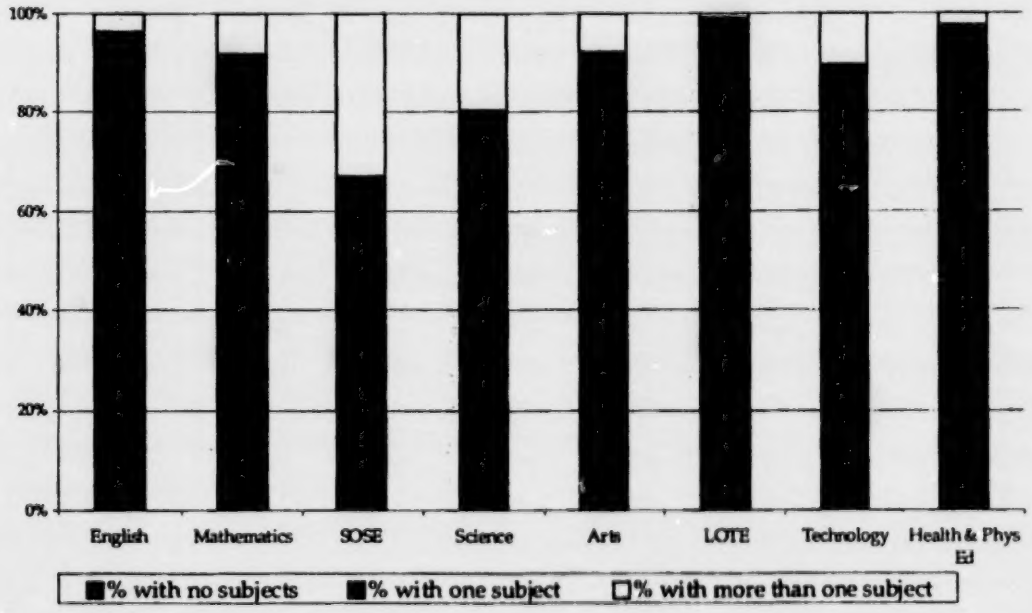

Figure 1 Percentage of Year 12 students studying subjects from specified subject areas, 1998

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Table 4 Year 12 enrolment levels in Key Learning Areas and specified subject areas in 1998

Key Learning Area	Subject Area	Percentage of Students		
		No subject	One subject	More than one subject
English	English	6.8	89.6	3.6
Mathematics	Mathematics	15.3	76.7	8.1
Society & Environment	Humanities/Social Sci	59.9	31.6	8.4
	Economics & Business	61.3	28.8	9.9
	Religion/Pastoral Care	88.0	12.0	0.0
		30.3	36.9	32.9
Science	Biological/Other Sci	56.5	40.2	3.2
	Physical Sciences	72.4	17.0	10.6
		40.5	39.9	19.6
Arts	Arts	69.4	22.9	7.7
LOTE	Languages	89.4	10.1	0.5
Technology	Technical Studies	82.2	14.2	3.5
	Computer Studies	75.6	23.4	1.0
	Home Science	84.5	13.8	1.7
	Agriculture	97.9	2.1	0.0
		53.7	35.9	10.4
Health & Physical Education	Physical Education	82.1	16.9	1.0
	Health	91.8	8.0	0.2
		73.7	24.2	2.1
Not Classified/Other		93.3	6.7	0.0

Mathematics

Approximately seven out of every eight students (87.5 per cent) studied a Mathematics subject, and of these just over 8 per cent studied more than one Mathematics subject. Within this subject area, however, it is important to draw some distinctions between participation in fundamental and higher levels of Mathematics. For example if just the data from Victoria are examined, it can be seen that of the 75 per cent of students who studied one or more Mathematics subjects, 20 per cent studied specialist mathematics (the highest level), 37 per cent studied mathematical methods (a level providing a basis for Mathematics studies at tertiary education) and 43 per cent studied either general mathematics or further mathematics. There are differences between these Mathematics subjects in the opportunities to which they provide access and the profiles of the students who enrol.

Studies of Society and Environment

Table 4 shows that seven out of every ten (70 per cent) of the Year 12 students were studying at least one subject from this Key Learning Area. In terms of the subject areas that constitute this Key Learning Area, around a third of students (31.6 per cent) studied

one subject in the area of humanities and social sciences while around 8 per cent studied more than one subject in the area.

While some of the subjects within the humanities and social sciences area are state specific, two that were common to every state were history and geography. While the history subjects varied between states (Modern History, Ancient History, Australian History), it can be seen from Table 5 that around 17 per cent of students were enrolled in history subjects. Around one in seven (13.8 per cent) of the Year 12 students were enrolled in geography subjects. Political studies and other subjects classified as social studies or social education enrolled almost 16 per cent of students.

Participation in economics and business subjects was similar to that for humanities and social sciences. Around 40 per cent of students were undertaking the study of some subjects within this subject area (29 per cent studied one subject and 10 per cent more than one subject). Business studies type subjects (business studies, business management) were the most commonly studied subjects in this area, being taken by about 17 per cent of students. Legal studies accounted for another 11 per cent of students, while economics enrolled a further 11 per cent of Year 12 students. Around 7 per cent of students were enrolled in accounting subjects, while 12 per cent of students included a religious studies subject in their course of study.

Science

While around three-fifths of Year 12 students studied a science subject, it is important to differentiate between enrolments in physical and biological sciences, as enrolment patterns are quite different between the two areas.

Just over two-fifths (43.5 per cent) of students include a biological science in their course of study, while slightly fewer than one-third of students (27.6 per cent) included a physical science. Of the students enrolled in the biological sciences, the majority (40 per cent) studied just one science subject, while of those undertaking physical sciences; almost 11 per cent were studying two subjects from the area.

While one-quarter of students were studying a biology subject (for example biology, human biology), about 20 per cent of students were studying physics and 20 per cent studying chemistry. Almost 6 per cent of students were studying psychology subjects, and around 10 per cent were studying a general or multi-strand science subject.

Arts

Around 30 per cent of students included a subject from the Arts Key Learning Area in their course of study. Most commonly this subject would be in the creative or visual arts area – just over 18 per cent of students were enrolled in subjects in this area. Other subjects were drawn from the performing arts (7 per cent), from music (5 per cent) and graphic communication (almost 3 per cent).

Table 5 Year 12 participation rates in subject areas

Key Learning Area	Subject /Subject Group	Percentage of Year 12 students	
		1993	1998
English	English	92.1	92.8
	ESL	1.2	0.8
	Literature	5.5	5.3
Mathematics	Mathematics	86.3	87.5
Society and Environment	History	21.1	17.4
	Geography	18.3	13.8
	Politics & Social Studies	15.2	15.7
	Economics	17.8	10.8
	Legal Studies	15.2	11.1
	Accounting	12.0	7.3
	Business Studies	9.2	17.1
	Secretarial Studies	4.3	1.8
	Tourism & Hospitality	1.9	1.5
	Religious Studies	17.6	12.2
Science	Chemistry	22.6	20.3
	Physics	20.4	20.0
	Biology	31.7	25.2
	General/Multi Strand Science	7.2	10.2
	Psychology	5.1	5.5
	Other Sciences	4.2	1.9
Arts	Creative and Visual Arts	17.4	18.2
	Performing Arts	7.3	6.6
	Graphic Communication	4.5	2.7
	Music	3.6	4.9
LOTE	French	1.9	1.5
	German	1.2	1.3
	Indonesian	na	0.8
	Italian	1.1	1.0
	Japanese	2.2	2.1
	Other languages	1.3	3.4
Technology	Computer Studies	20.7	27.7
	Technical Studies	16.9	23.2
	Home Science	11.0	4.7
	Food/Catering	3.8	6.5
	Agriculture	2.4	2.8
	Child Studies	na	1.1
Health & Physical Education	Physical Education	17.6	17.7
	Health	1.9	8.5
Not Classified/Other		1.7	7.2

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Languages Other Than English

Only one student in ten studied a language other than English (LOTE) in Year 12. For the vast majority of these students only one language was studied, however the enrolments were spread over a range of languages.

Technology

This Key Learning Area embraces a number of different subject areas: technical and applied studies (such as materials and technology, woodwork, textiles, engineering), computer studies or information technology, home science or home economics, and agriculture. Slightly less than half (46 per cent) of all Year 12 students included subjects from this Key Learning Area in their course of study.

Computer studies was the subject area in this area most frequently chosen by students. Almost one-quarter (24 per cent) took a computing subject; very few took more than one subject. Technical and applied studies of a more traditional form enrolled almost one-fifth of all Year 12 students (18 per cent). Most of these students (14 per cent) studied just one subject. Home science enrolled just over 15 per cent of students in Year 12, with very few students undertaking more than one subject in the area. Agriculture had very low levels of participation, with around 2 per cent of students choosing an agriculture subject.

Health and Physical Education

Just over one-quarter (26 per cent) of all Year 12 students chose a subject from the Health and Physical Education Key Learning Area in their course of study. Most commonly this was a physical education subject (18 per cent), while around 8 per cent of students included a health subject.

Enrolment Indices

Enrolment indices provide an indication of the level of enrolments in that area for a group of students. It can be thought of as representing "curriculum share" for particular subject areas, and is defined as the sum of the equivalent full-year enrolments in a given subject area divided by the total number of equivalent full-year enrolments in all areas. Hence the sum of the values of the enrolment index over all subject areas is 100. The values in Figure 2 are calculated as a weighted percentage of all enrolments in classified subject areas, that is, with the omission of subjects in the "other" category.

The data depicted in Figure 2 show that enrolments in the Mathematics and Science Key Learning areas account for 30 per cent of enrolments, slightly down from the 1993 level of 35 per cent. Enrolments in the combined English and LOTE Key Learning Areas have remained stable from 1993, enrolling one-fifth of students (20 per cent). Enrolments in Studies of Society and Environment accounted for slightly fewer enrolments than in 1993 (20 per cent as compared to 23 per cent in 1993), enrolments in the Health and Physical Education Key Learning Area remained fairly stable at around 5 per cent, and enrolments in the Arts Key Learning Area also remained stable at 7 per cent. The growth area from 1993 appears to be in the Technology Key Learning Area, accounting for almost one-fifth of enrolments (18 per cent) compared to just over one-tenth (11 per cent) of students in 1993.

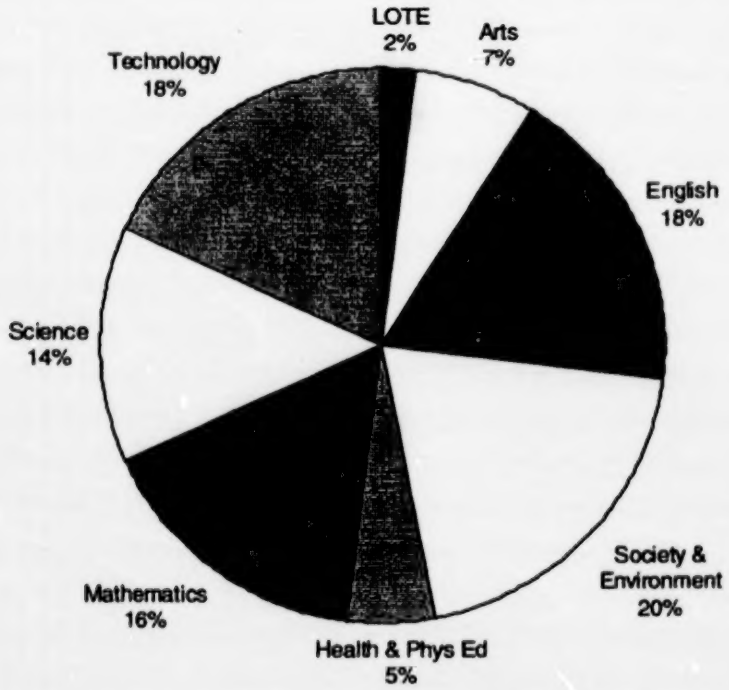

Figure 2 Percentage Year 12 enrolments in Key Learning Areas for classified subjects, 1998

Comparison of the enrolment indices for each of the Key Learning Areas and the specific subject areas for 1993 and 1998 is presented in Table 6. Comparison of the figures for 1993 and 1998 reveal that there has been a slight increase in enrolments for the Key Learning Area of English and a slight decline in enrolments in Mathematics. There has been a small decline in enrolments in Studies of Society and Environment, in which there has been a larger decline in the area of economics and business studies than in the general humanities and social sciences area.

There has been an overall decline in enrolments in the Science Key Learning Area, both in the biological sciences and in the physical sciences. Further examination of the data in Table 5 show that the decline in enrolments in the physical sciences has been in the area of chemistry, while enrolments in physics have remained stable. In the biological sciences, the decline in overall enrolments is an effect primarily of the decline in enrolments in biology, with enrolments in psychology and general science increasing slightly.

Enrolments in the Arts Key Learning Area show an overall slight decrease in level of enrolments. It can be seen from Table 5 that the decline in enrolments in the areas of performing arts and graphic communication slightly outweighed the small increases in enrolments in music and creative and visual arts.

An overall increase in the level of enrolments in technical studies and computer studies is reflected in the increased proportion of enrolments in the Key Learning Area of Technology, which has increased by just under three percentage points from the 1993 data. A slightly smaller increase in the level of enrolments in the Health and Physical Education area was caused by an increase in enrolments in both subjects.

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Table 6 Enrolments[a] in Key Learning Areas and specified subject areas, 1993 and 1998

Key Learning Area	Subject Area	1993	1998
English	English	18.2	18.7
Mathematics	Mathematics	17.9	17.7
Society & Environment	Humanities & Social Sciences	9.6	8.8
	Economics & Business	11.3	9.3
	Religion & Pastoral Care	2.0	2.0
		22.9	20.1
Science	Biological & Other Sciences	9.5	7.7
	Physical Sciences	7.7	7.5
		17.2	15.2
Arts	Arts	6.9	6.6
LOTE	Languages	1.8	1.9
Technology	Technical Studies	3.6	5.3
	Computer Studies	3.7	5.3
	Home Science	2.8	2.4
	Agriculture	0.5	0.5
		10.6	13.5
Health & Physical Education	Physical Education	3.2	3.5
	Health	0.7	1.6
		3.9	5.1
Not Classified/Other		0.3	1.3

a as measured by the enrolment index

SUBJECT AREA ENROLMENTS AND STUDENT CHARACTERISTICS

A focus for the current project was to examine patterns of enrolments in subject areas in terms of the kinds of students who undertake them. The following sections of the report look at the nature and extent of the associations between student participation, as measured by the enrolment index, (representing curriculum share for the subject group) and a range of student background characteristics such as gender, social background, and ethnicity.

Gender

The enrolment index values by gender for the Year 12 students are shown in Table 7 and Figure 3. These data generally confirm differences in enrolment patterns between males and females that have been seen in previous studies.

In 1998, as in 1993 and 1990, the subject areas in which females continue to account for a high proportion of enrolments are home science (where they make up 71 per cent of enrolments), Languages other than English (68 per cent of enrolments) and health (63 per cent of enrolments). Males clearly predominate in technical studies (80 per cent of enrolments), in computer studies (65 per cent of enrolments), physical education (67 per cent of enrolments), and agriculture (75 per cent of enrolments). It should be noted, however, that each of these subject areas accounts for only a relatively small proportion of total enrolments at Year 12.

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Table 7 Enrolments[a] for Year 12 in subject areas by gender

Key Learning Area	Subject Area	Male	Female
English	English	18.1	19.7
Mathematics	Mathematics	18.4	16.1
Society &Environment	Humanities/Soc Sciences	8.2	10.1
	Economics & Business	9.2	9.7
	Religion/Pastoral Care	2.0	2.2
		19.4	22.0
Science	Biological/Other Sciences	6.6	10.1
	Physical Sciences	8.5	5.3
		15.1	15.4
Arts	Arts	5.5	8.9
LOTE	Languages	1.4	3.0
Technology	Technical Studies	7.0	1.7
	Computer Studies	6.2	3.4
	Home Science	1.6	4.0
	Agriculture	0.6	0.2
		15.4	9.3
Health & Physical Education	Physical Education	4.1	2.1
	Health	1.3	2.2
		5.4	4.3
Not Classified/Other		1.4	1.1

a as measured by the enrolment index

By comparison, the Key Learning Area of Science enrols a significant proportion of students. The total proportion of enrolments in Science shown in Table 7 shows only a small difference in the proportions of males and females studying Science, however the data for the two strands of Science show marked differences along gender lines. As with the 1993 data, males make up 62 per cent of the enrolments in the physical sciences, while females make up 60 per cent of the enrolments in the biological and other sciences. In comparison to the data from previous years, the enrolment index values for both males and females in the biological and other sciences has declined (for males from 7.6 in 1993 to 6.6 in 1998, and for females from 11.2 in 1993 to 10.1 in 1998). The enrolment index values for both males and females in the physical sciences has also declined (for males from 10.2 in 1993 to 8.5 in 1998, and for females from 5.6 in 1993 to 5.3 in 1998), and for males to a greater extent than for females.

In the Key Learning Area of Mathematics there is still a slightly higher proportion of males enrolled. This area has seen a small decline in enrolments by males (from 19.7 in 1993 to 18.4 in 1998) and a slightly smaller decline for females (from 16.4 in 1993 to 16.1 in 1998). However the Victorian data indicate that the grouping together of all Mathematics units masks much larger differences in participation rates. In these data, males make up 78 per cent of the enrolments in specialist mathematics, whereas they constitute 67 per cent of enrolments in mathematics methods and 63 per cent of enrolments in fundamental mathematics (general or further mathematics).

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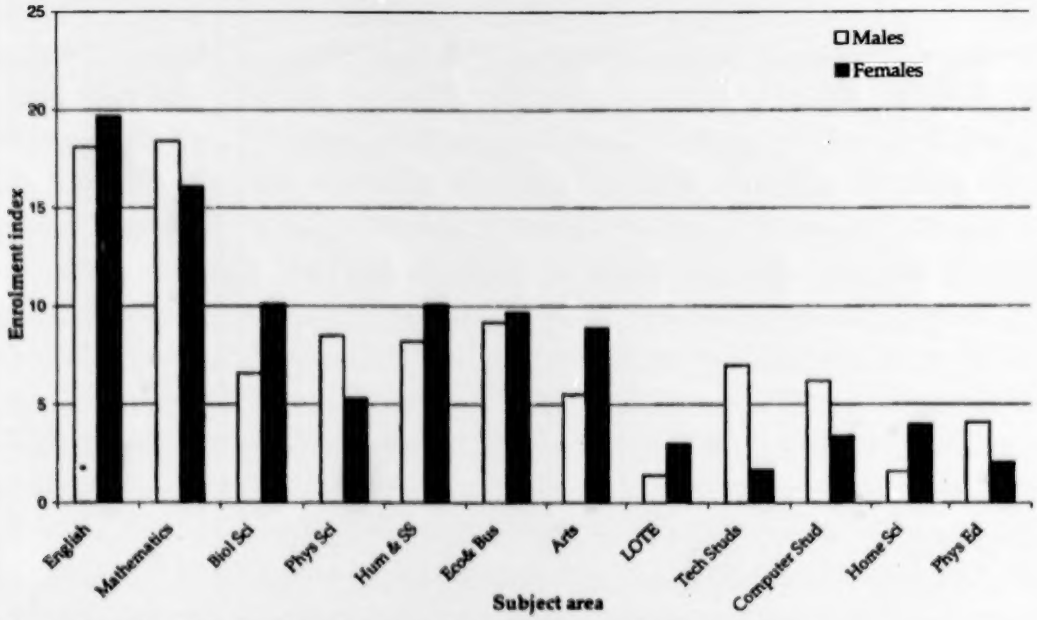

Figure 3 Year 12 enrolments in various subject areas by gender

In 1998, as they were in 1990 and 1993, enrolments in the English, Studies of Society and the Environment and the Arts Key Learning Areas the enrolment index values for females tend to be slightly higher for females than males.

There was a decline in the levels of enrolments for both males and females in Studies of Society and Environment, however there are higher levels of enrolment for females in both Humanities and Social Sciences and in the economics and business studies areas. Participation in the Arts Key Learning Area has increased for females (from 7.8 in 1993 to 8.9 in 1998) and slightly decreased for males (from 5.9 in 1993 to 5.5 in 1998).

Social Background

This analysis uses two elements of social background – socioeconomic status, as measured by parents' occupational prestige, and parents' educational background. Table 8 records differences in enrolments according to parents' occupational group, while Table 9 records differences associated with parents' education.

Socioeconomic status As has been seen in previous studies, the subject area in which the greatest effect of socioeconomic status can be seen is in the physical sciences (Table 8 and Figure 4). Although there has been a decline in enrolments in this area, this decline is spread across all socioeconomic groups. However participation by students whose parents are in professional jobs remains more than twice the level of those students whose parents are in unskilled or semi-skilled jobs (an enrolment index of 12.1 for the former group and 6.0 for the latter group).

Table 8 Enrolments[a] for Year 12 in subject areas by socioeconomic status

Key Learning Area	Subject Area	Low	Low mid	Upp mid	High
English	English	18.2	18.6	19.1	18.8
Mathematics	Mathematics	17.6	17.3	17.7	19.1
Society & Environment	Humanities/Social Sciences	8.0	8.1	10.2	9.8
	Economics & Business	10.1	9.1	9.3	9.2
	Religion/Past Care	1.7	2.0	2.2	2.7
		19.8	19.2	21.7	21.7
Science	Biological/Other Sciences	7.7	8.2	8.2	7.1
	Physical Sciences	6.0	6.2	8.5	12.1
		13.7	14.4	16.7	19.2
Arts	Arts	6.0	7.0	6.6	5.3
LOTE	Languages	1.7	1.2	2.0	3.0
Technology	Technical Studies	6.2	6.3	3.8	3.5
	Computer Studies	6.3	5.5	5.0	3.9
	Home Science	2.5	2.7	1.6	1.0
	Agriculture	0.7	0.8	0.2	0.2
		15.7	15.3	10.6	8.6
Health & Physical Education	Physical Education	3.8	3.9	3.2	2.2
	Health	2.0	1.6	1.6	1.2
		5.8	5.5	4.8	3.4
Not Classified/Other		1.7	1.4	0.8	0.8

a as measured by the enrolment index

Higher enrolments in mathematics, humanities and social sciences, and Languages other than English were similarly associated with higher socioeconomic status. Again, the study of Mathematics is worthy of further analysis. Using the Victorian data as an example, 26 per cent of students enrolled in specialist mathematics were from the highest level of socioeconomic background. The figure was 22 per cent for mathematics methods and 11 per cent for general or further mathematics.

In contrast, enrolments in some subject areas were higher for the lowest socioeconomic level and tended to fall as this level rose: economics and business, and all of the subject areas within the Key Learning Areas of Technology and Health and Physical Education.

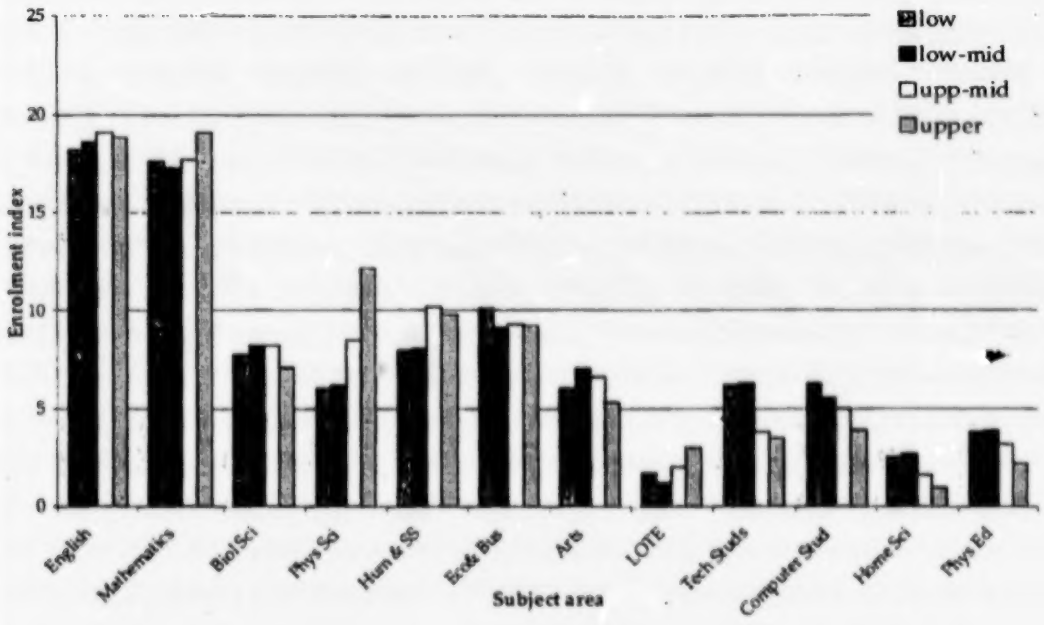

Figure 4 Year 12 enrolments in various subject areas by socioeconomic status

Parents' education The trends noted in the previous section were also observed when the relationship between level of enrolment and parents' education was examined (Table 9, and Figure 5). Again, the strongest association can be seen in the physical sciences, where students whose parents had undertaken higher education were more than twice as likely to be enrolled than those students whose parents had reached middle secondary level (the enrolment index was 10.9 for the former group of students and 5.2 for the latter group). Higher levels of parental education were also associated with higher enrolments in mathematics and humanities and social sciences. In Mathematics in particular, again using the Victorian data as an example, 55 per cent of the students in specialist mathematics had parents from the highest educational level (a completed higher education qualification), compared to 46 per cent of students in mathematics methods and 34 per cent of students in general or further mathematics.

Table 9 Enrolments[a] for Year 12 in subject areas by parents' educational level

Key Learning Area	Subject Area	Middle secondary	Full secondary	Higher education
English	English	18.5	18.7	19.0
Mathematics	Mathematics	17.0	17.6	18.6
Society & Environment	Humanities/Social Sci	8.5	8.3	9.6
	Economics & Business	10.0	9.8	9.4
	Religion/Past Care	1.6	1.9	2.5
		20.1	20.0	21.5
Science	Biological/Other Sci	8.0	8.0	7.4
	Phys Sciences	5.2	6.8	10.9
		13.2	14.8	18.3
Arts	Arts	6.1	6.2	6.1
LOTE	Languages	2.0	1.4	2.5
Technology	Tech Studies	6.3	6.0	3.4
	Computer Studies	5.9	5.6	4.4
	Home Science	3.4	2.2	1.1
	Agriculture	0.7	0.6	0.4
		16.3	14.4	9.3
Health & Physical Education	Physical Education	3.5	4.0	2.6
	Health	1.7	1.6	1.3
		5.2	5.6	3.9
Not Classified/Other		1.5	1.4	0.9

[a] as measured by the enrolment index

The reverse trend was true for a similar range of subjects as seen in the previous section; enrolments in economics and business, and in the Technology Key Learning Area were highest amongst those students from the least educated background, lowest for those from the most highly educated background. As an illustration, the enrolment index for the Key Learning Area of Technology was 16.3 among students with parents with the lowest educational background, 9.3 amongst those students whose parents had the highest levels of education. While enrolments in the Health and Physical Education Key Learning Area followed the same trend, the difference between students from the different educational backgrounds was not as great as was seen in 1993.

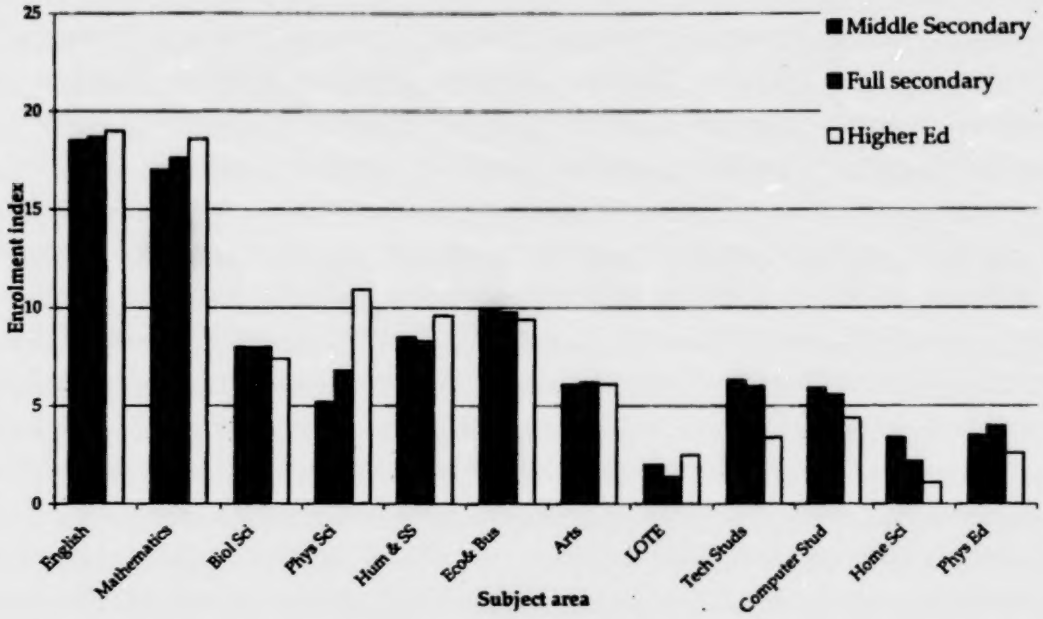

Figure 5 Year 12 enrolments in various subject areas by parents' educational level

Ethnic Background

Information about two aspects of students' ethnicity was collected in this survey. Students were asked about the language most commonly spoken at home, and about their birthplace and their parents' birthplaces. Responses to the individual questions about parents' birthplaces was aggregated to a measure of "parental birthplace", where father and mother born in an English-speaking country was coded as English-speaking birthplace, and either parent from a non-English speaking country as a non-English speaking birthplace. There were 12 per cent of students from homes in which English was not the primary language, and 23 per cent of the students identified as coming from families in which one or both of the parents' birthplace was a non-English speaking country.[1] As the latter measure provides a greater proportion of students, it will be reported in this section.[2]

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[1] Of these students, approximately 37 per cent were from homes with one parent from a non-English speaking background; the remaining 63 per cent had two parents of non-English speaking background.

[2] The analysis conducted in this section was repeated with students' home language as the focus, however the results show a similar pattern to those for parents' birthplace. As such it is not particularly meaningful to include both analyses. The analyses were also repeated separately for those students with a single NESB parent and those with two NESB parents. A number of the trends that are apparent in Table 10 are stronger for those students who have two NESB parents. Enrolments in Economics and Business, Physical Sciences and LOTE are substantially higher for students from a dual NESB family than for those with only one NESB parent, while enrolments in Technical Studies decrease by level of NESB. Thus, it would appear that the stronger a student's non-English speaking background, the more likely they are to be studying subjects that aim at entry into professions.

Table 10 Enrolments[a] for Year 12 in subject areas by parental birthplace

Key Learning Area	Subject Area	Aust/English	Non-English
English	English	18.7	18.7
Mathematics	Mathematics	17.4	18.6
Society & Environment	Humanities/Social Science	9.1	8.1
	Economics & Business	8.5	12.6
	Religion/Past Care	1.8	2.8
		19.4	23.5
Science	Biological/Other Sciences	8.0	6.8
	Physical Sciences	7.2	8.5
		15.2	15.3
Arts	Arts	6.8	5.4
LOTE	Languages	1.4	3.4
Technology	Technical Studies	5.7	3.9
	Computer Studies	5.4	5.1
	Home Science	2.5	1.8
	Agriculture	0.7	0.0
		14.3	10.8
Health & Physical Education	Physical Education	4.0	1.6
	Health	1.7	1.3
		5.7	2.9
Not Classified/Other		1.3	1.2

a as measured by the enrolment index

Table 10 records the subject enrolment index values for student from different ethnic backgrounds as indicated by parental birthplace. Compared to students with parents born in Australia or another English-speaking country, students whose parents were born in a non-English speaking country were more likely to study mathematics, physical sciences (where the enrolment index values were 8.5 compared with 7.2), economics and business (enrolment index values 12.6 as compared to 8.5), and again, Languages other than English (just over twice as many enrolments, with enrolment index values of 3.4 compared to 1.4). Again using the Victorian data as an example, 23 per cent of students whose parents were born in a non-English speaking country compared to 19 per cent of students from an Australian or other English speaking country were studying an specialist mathematics. Students whose parents were born in Australia or another English speaking country were more likely to study humanities and social sciences (9.1 compared to 8.1), biological and other sciences (8.0 compared to 6.8), arts subjects (6.8 compared to 5.4), and subjects from the Technology (14.3 compared to 10.8) and Health and Physical Education (5.7 compared to 2.9) Key Learning Areas.

Aboriginal and Torres Strait Islander Students

Students who identified themselves as being from an Aboriginal or Torres Strait Islander background made up just 1.5 per cent of the sample for this survey. As such, not too many conclusions can be drawn about the subjects chosen by this group of students. The number of Aboriginal students in this sample is such that differences between rural and urban Aboriginal students could not be examined. There were 70

students who identified themselves as Aboriginal or Torres Strait Islander background, 35 in urban areas, 23 in regional areas and 12 in rural or remote communities.

Figure 6 provides a comparison of the enrolment levels of Aboriginal and other Australian students over a range of Year 12 subjects. With the caveat necessary when dealing with such small numbers of students, it can be seen from this figure that students from an Aboriginal and Torres Strait Islander background are in general enrolled in English, mathematics, arts, technical studies and home sciences to the same extent as other Australian students. These data do suggest that there is a need for further studies examining within-group variation amongst Aboriginal and Torres Strait Islander students, using focussed data sets and the types of analyses undertaken by Long, Frigo and Batten (1999).

However they are more likely than other Australian students to be enrolled in the biological sciences, humanities and social sciences, computer studies and physical education. Aboriginal and Torres Strait Islander students are less likely than other Australian students to be enrolled in the physical sciences, economics and business, and LOTE. The greatest difference lies in the physical sciences, where other Australian students are almost twice as likely to undertake subjects in this area than Aboriginal or Torres Strait Islander students (enrolment index values of 7.6 for the former group, 4.0 for the latter). An examination of these data by gender (and given that the numbers are too small to be generalisable) show that female Aboriginal and Torres Strait Islander students are more likely to study the physical sciences than their male counterparts (enrolment index values of 3.6 for males, 4.8 for females), a trend that is the opposite of that shown before for both this group of students and for other Australian students.

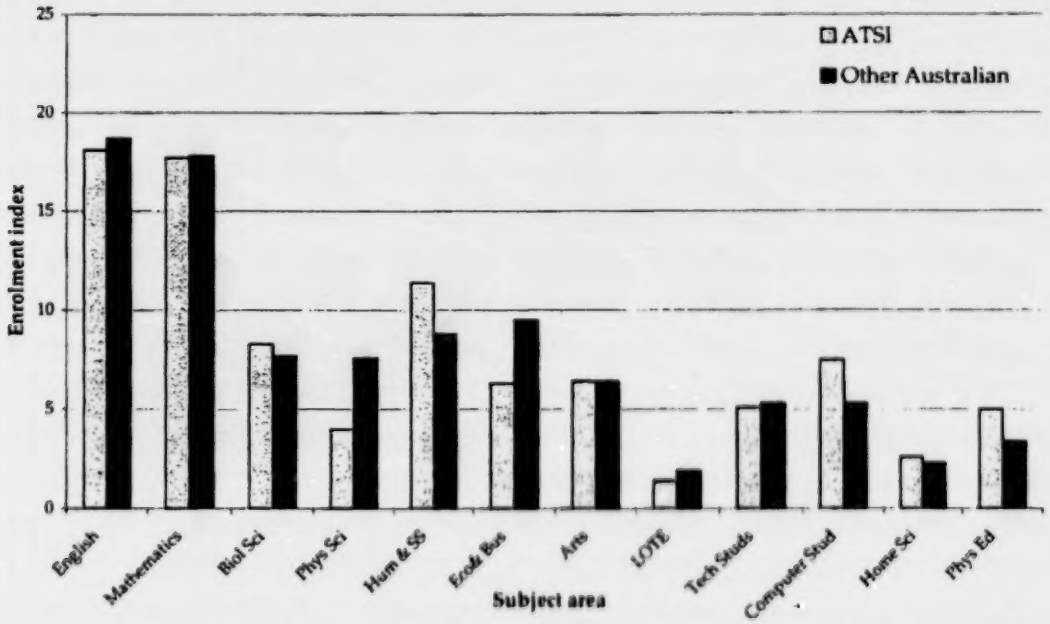

Figure 6 Year 12 enrolments in various subject areas by Aboriginal or Torres Strait Islander status

ACHIEVEMENT AND SUBJECT AREA ENROLMENTS

The longitudinal nature of these data allows the opportunity to examine the relationships between achievement in the early years of secondary schooling and subject choice in Year 12. Information on achievement in literacy and numeracy was gathered in 1995 when the respondents were in Year 9. Enrolment index values for each quartile on numeracy and literacy tests are recorded in Table 11 and Table 12, while Table 13 refers to a composite achievement variable.

English

As shown in Table 11, there was little relationship between early school achievement in numeracy and participation in English at Year 12, but quite a strong relationship can be seen between early school achievement in literacy and participation in English. This is to be expected since most students study one English subject, and it will be the students with high achievement who will study the extra English subjects such as English Literature.

Table 11 Enrolments[a] for Year 12 in subject areas by achievement in numeracy

Key Learning Area	Subject Area	Lowest	Second	Third	Highest
English	English	18.6	18.8	18.7	18.6
Mathematics	Mathematics	15.0	16.1	18.0	20.5
Society & Environment	Humanities/Social Sci	8.9	8.6	9.3	8.3
	Eco & Business	9.4	9.9	9.4	8.8
	Religion/Past Care	1.9	1.9	2.3	1.9
		20.2	20.4	21.0	19.0
Science	Biological/Other Science	7.5	8.4	8.5	6.5
	Physical Sciences	1.7	3.6	7.4	14.4
		9.2	12.0	15.9	20.9
Arts	Arts	7.6	7.2	6.8	5.2
LOTE	Languages	1.5	1.6	1.7	2.6
Technology	Technical Studies	8.3	6.6	4.5	3.2
	Computer Studies	6.2	6.2	5.2	4.2
	Home Science	4.7	3.0	1.8	1.0
	Agriculture	0.7	0.6	0.6	0.3
		19.9	16.4	12.1	8.7
Health & Physical Education	Physical Education	4.3	4.3	3.4	2.2
	Health	1.9	1.6	1.5	1.4
		6.2	5.9	4.9	3.6
Not Classified/Other		1.9	1.6	1.1	0.9

a as measured by the enrolment index

Mathematics

Early school achievement in both literacy and numeracy is associated with a greater proportion of students studying Mathematics at Year 12, (enrolment index values of 15 for the lowest numeracy achievement quartile as compared with 20.5 for the highest). Although a high proportion of students study some Mathematics at Year 12, these data indicate that students with the higher achievement levels tend to study more than one Mathematics subject. The Victorian data also suggest that, as one would expect, students with high early school achievement levels are far more likely to attempt the more advanced forms of mathematics (such as specialist mathematics) at year 12. Students whose mathematics achievement in Year 9 placed them in the top quartile constituted 61 per cent of the enrolments in specialist mathematics but only 33 per cent of mathematics methods enrolments and 14 per cent of enrolments in general or further mathematics.

Studies of Society and Environment

These data show little relationship between students' early achievement in numeracy and their participation in this Key Learning Area. There is a slight trend towards lower enrolment levels in both humanities and social sciences and economics and business by those in the highest achievement quartile, however these differences are not large. Students in the highest quartiles of literacy achievement, however, are much more likely to study humanities and social sciences than those in the lowest achievement quartile (10.2 for the former, 7.2 for the latter), and are also slightly more likely to study economics and business subjects than those in the lowest achievement quartiles, although this difference is of the same magnitude, although in the opposite direction, to that for the numeracy achievement levels.

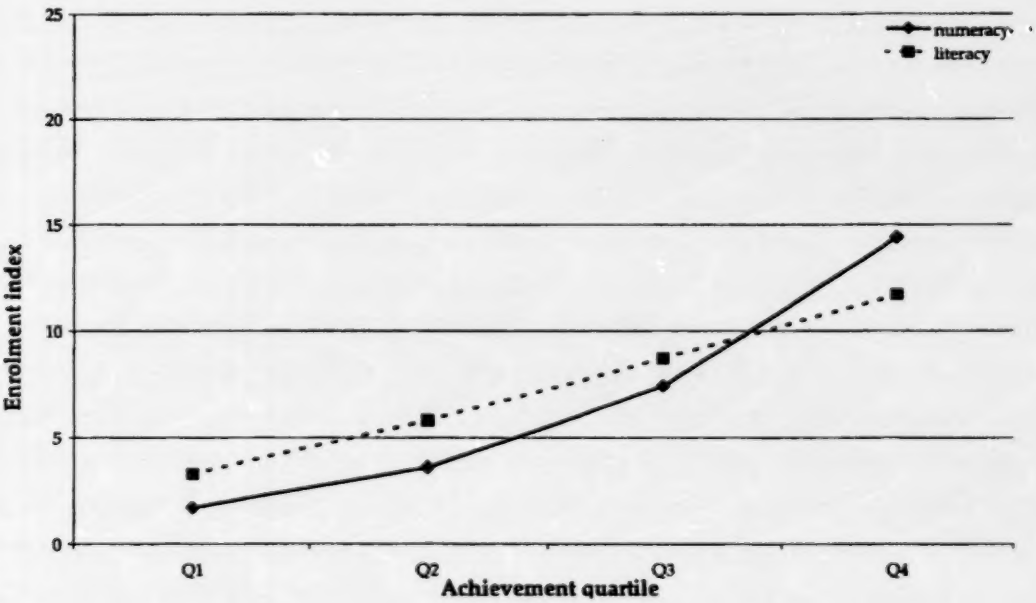

Figure 7 Participation in physical sciences by literacy and numeracy achievement quartiles

Table 12 Enrolments[a] for Year 12 in subject areas by achievement in literacy

Key Learning Area	Subject Area	Lowest	Second	Third	Highest
English	English	18.0	18.5	18.8	19.2
Mathematics	Mathematics	16.4	16.9	18.4	19.1
Society & Environment	Humanities/Social Sci	7.2	8.2	9.2	10.2
	Economics & Business	8.5	9.6	9.8	9.3
	Religion/Past Care	2.3	1.9	1.8	2.3
		18.0	19.7	20.8	21.8
Science	Biological/Other Science	7.0	7.8	8.1	7.[illegible]
	Physical Sciences	3.3	5.8	8.7	11.7
		10.3	13.6	16.8	19.5
Arts	Arts	6.7	7.1	6.6	6.0
LOTE	Languages	1.4	1.3	2.1	2.7
Technology	Technical Studies	8.8	6.5	4.2	2.2
	Computer Studies	6.6	6.2	4.8	3.8
	Home Science	4.5	2.5	1.6	1.2
	Agriculture	0.9	0.5	0.5	0.3
		20.8	15.7	11.1	7.5
Health & Physical Education	Physical Education	5.0	3.9	2.9	2.2
	Health	1.8	1.8	1.5	1.2
		6.8	5.7	4.4	3.4
Not Classified/Other		1.9	1.5	1.1	0.7

a as measured by the enrolment index

Science

The students most likely to study subjects in the biological and other science areas tend to come from the middle two achievement levels of numeracy, with fewest participants from the highest achievement levels. The opposite can be seen for participation in the physical sciences. Figure 7 shows the participation rates for students at each quartile of achievement in literacy and numeracy. Students who achieve at the highest level of literacy are more than three times as likely to study either physics or chemistry, and students in the highest numeracy quartile are more than eight times as likely to study these subjects.

Arts

There was little association between participation in Arts subjects and earlier achievement in literacy, with a slight trend towards students' participation from the lower end of the achievement quartiles. The relationship between achievement in numeracy and participation in the Arts was more pronounced, with a definite trend towards those achieving at a higher level in early numeracy tests being less likely to study subjects from this area.

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Table 13 Enrolments[a] for Year 12 in subject areas by overall achievement quartiles

Key Learning Area	Subject Area	Lowest	Second	Third	Highest
English	English	18.4	18.6	18.7	18.8
Mathematics	Mathematics	15.4	16.1	17.9	19.9
Society & Environment	Humanities/Soc Science	8.0	8.2	9.3	9.1
	Economics & Business	8.8	9.8	9.8	9.0
	Religion/Pastoral Care	2.0	2.0	2.0	2.1
		18.8	20	21.1	20.2
Science	Biological/Other Science	7.3	8.3	8.7	6.9
	Physical Sciences	2.0	3.6	7.0	13.5
		9.3	11.9	15.7	20.4
Arts	Arts	6.9	7.6	6.8	5.7
LOTE	Languages	1.4	1.4	1.7	2.6
Technology	Technical Studies	8.6	7.2	4.4	2.8
	Computer Studies	6.8	5.9	5.3	4.0
	Home Science	4.9	2.9	1.8	1.0
	Agriculture	0.8	0.6	0.6	0.3
		21.1	16.6	12.1	8.1
Health & Physical Education	Physical Education	5.0	4.3	3.3	2.2
	Health	1.8	1.9	1.5	1.3
		6.8	6.2	4.8	3.5
Not Classified/Other		1.9	1.7	1.2	0.8

a as measured by the enrolment index

Languages other than English

As had been seen in the 1993 subject choice report, Languages other than English continued to attract students from the top achievement quartiles in literacy and numeracy, these students being almost twice as likely to study a language at Year 12 than those in the lowest achievement quartile.

Technology

The Technology Key Learning Area encompasses a range of subjects, and for each of these subjects there was a negative association between enrolments and earlier school achievement in literacy and numeracy. This association was particularly strong for Technical studies, where students from the lowest achievement quartile were around three times as likely to be enrolled as students from the highest achievement quartile. In computer studies the trend was in a similar direction, however the magnitude was not as great; students in the lowest achievement quartile being about one and a half times as likely to study subjects in this area. The same trend was also quite clear for home science, where the lowest achievement quartile enrolled about five times as many students as the highest quartile.

Health and Physical Education

Enrolment in both subjects in this Key Learning Area was greater for those from the lower levels of achievement. For physical education these differences were more

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marked, where enrolments from the top achievement quartile were only about one-half of those from the lowest achievement quartile.

SCHOOL SYSTEM, STATE AND LOCATION

Factors such as type of school attended, and geographical factors such as state of residence and location of the school attended have some influence on the subject areas in which students are enrolled.

School Sector

Subject area enrolments for government, Catholic and independent schools are shown in Table 14, and there are small but important differences in these enrolments.

Enrolments in mathematics and the physical sciences show similar patterns of enrolment. In both areas there is a higher rate of enrolment for students from independent schools than for students in either government or Catholic schools. For example in the physical sciences, students from independent schools are about one-and-a-half times more likely to study these subjects than students in government or Catholic schools, the enrolment index values being 10.6 for independent schools and 6.9 and 7.0 respectively for students in government and Catholic schools. Of interest is a change in enrolments from the 1993 data that shows a growth in enrolments in both mathematics and the physical science for students in Catholic schools, and a very slight growth in enrolments in the physical sciences for students in independent schools.

Table 14 Enrolments[a] for Year 12 in subject areas by school type

Key Learning Area	Subject Area	Govt	Cath	Indept
English	English	18.9	18.1	18.6
Mathematics	Mathematics	17.6	17.4	18.5
Society & Environment	Humanities/Social Sciences	8.6	8.3	10.0
	Economics & Business	9.0	10.1	9.5
	Religion/Pastoral Care	0.3	7.3	1.2
		17.9	25.7	20.7
Science	Biological/Other Sciences	7.8	7.8	7.4
	Physical Sciences	6.9	7.0	10.6
		14.7	14.8	18
Arts	Arts	7.0	5.7	6.4
LOTE	Languages	1.4	2.2	3.5
Technology	Technical Studies	6.3	3.5	3.7
	Computer Studies	5.8	4.8	3.9
	Home Science	2.9	1.7	1.2
	Agriculture	0.6	0.5	0.2
		15.6	10.5	9
Health & Physical Education	Physical Education	3.8	2.8	3.2
	Health	1.8	1.3	1.2
		5.6	4.1	4.4
Not Classified/Other		1.3	1.5	0.8

a as measured by the enrolment index

The same time period has seen a decline in enrolments in both mathematics and the physical science by students in government schools. Students from independent schools are also over-represented in area of humanities and the social sciences, with an enrolment index of 10.0 compared to 8.6 for government and 8.3 for Catholic schools.

Students from independent schools are also more likely to study Languages other than English, where the enrolment index was 3.5 compared to the lowest value in government schools of 1.4. It should be noted however that LOTE is a relatively small area in terms of total enrolments.

Students from government schools are more likely than those in either Catholic or independent schools to be studying subjects in the Technology and the Health and Physical Education Key Learning Areas, and these differences are more pronounced in the Technology area.

Further points to note about subject area enrolments of students in Catholic schools is the substantial proportion of students including a religious study in their course and the lower proportions of students enrolled in Arts subjects, lower than that for either independent or government schools.

Table 15 Enrolments[a] for Year 12 in subject areas by State

Key Learning Area	Subject Area	State							
		NSW	Vic	Qld	SA	WA	Tas	ACT	NT
English	English	18.1	22.5	16.9	13.5	18.6	14.1	19.6	20.0
Mathematics	Mathematics	17.7	17.8	18.4	17.0	18.2	10.0	17.5	19.9
Society and Environment	Human/Soc Sci	12.6	4.2	7.5	10.5	10.3	8.9	7.0	8.1
	Eco & Business	10.0	10.5	7.3	12.3	6.9	6.0	7.0	10.2
	Relig/Past Care	3.3	1.6	1.3	2.5	0.1	1.4	4.3	2.0
		25.9	16.3	16.1	25.3	17.3	16.3	18.3	20.3
Science	Biological Science	5.7	8.0	9.7	8.4	9.4	8.0	5.2	7.7
	Physical Sciences	6.9	8.0	6.8	10.4	7.5	6.0	6.1	6.8
		12.6	16	16.5	18.8	16.9	14.0	11.3	14.5
Arts	Arts	5.7	7.3	6.8	6.5	5.7	12.2	9.6	6.1
LOTE	Languages	1.4	3.0	1.3	1.8	1.5	2.2	2.6	1.8
Technology	Technical Studies	4.7	3.6	7.0	4.5	8.2	8.3	5.9	2.3
	Computer Studies	5.4	5.8	4.9	3.8	4.9	7.7	5.3	6.2
	Home Science	1.9	2.6	2.8	2.7	1.9	3.7	1.2	2.4
	Agriculture	0.6	0.3	0.6	0.8	0.4	1.2	0.5	0.2
		12.6	12.3	15.3	11.8	15.4	20.9	12.9	11.1
Health & Physical Education	Physical Ed	0.9	3.4	6.3	4.1	4.6	5.1	6.3	6.3
	Health	3.8	0.8	0.2	0.4	0.2	2.8	0.0	0.0
		4.7	4.2	6.5	4.5	4.8	7.9	6.3	6.3
Not Classified / Other		1.3	0.7	2.0	0.8	1.6	2.2	1.7	0.0

a as measured by the enrolment index

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State Differences

State enrolment patterns for Year 12 enrolments are shown in Table 15. As previous studies have found, there are quite large variations by state in the level of enrolment in English subjects, ranging from a high of 22.5 in Victoria to a low of 13.5 in South Australia and 14.1 in Tasmania. For Mathematics, the enrolment index was greatest in the Northern Territory (19.9), Queensland (18.4) and Western Australia (18.2), somewhat lower in New South Wales, Victoria, South Australia and the Australian Capital Territory (17.7, 17.8, 17.0, and 17.5 respectively) and very much the lowest in Tasmania (10.0).

Enrolments in humanities and social science subjects were found to increased in Queensland, South Australia and the Australian Capital Territory and decreased in all other states. Enrolments in these subjects were found to be the highest in New South Wales (12.6) and the lowest in Victoria (4.2). Enrolments in economics and business subjects were the highest in South Australia (12.3) and the lowest in Tasmania (6.0), however enrolments in this area have declined in all states from the levels found in 1993.

Levels of enrolment in the Sciences have in general shown a substantial decline since the 1993 report. In the biological sciences in particular, enrolment levels have declined in every state, most substantially in Tasmania, where the proportion of enrolments has halved, from 16.2 in 1993 to 8.0 in 1998. This is seen to be coupled with a decline in enrolments in the physical sciences as well that has resulted in overall enrolments in the Sciences drop from the highest in Australia in 1993 (25.6) to one of the lower rates (14.0). In New South Wales, Victoria and South Australia enrolments in the physical sciences have increased slightly. The highest level of enrolments is in South Australia (10.4), and the lowest in Tasmania (6.0).

Enrolments in the Arts has, in contrast, been somewhat of a boom area for Tasmanian students, where the enrolment index has increased from 8.2 in 1993 to the highest level in Australia of 12.2 in 1998. The Australian Capital Territory also has fairly high levels of enrolments (enrolment index of 9.6), while the lowest level of enrolments in the Arts is in the Northern Territory (6.1).

While remaining a very small proportion of overall enrolments, enrolments in Languages other than English have increased in all states other than South Australia and New South Wales; the highest levels can be seen in Victoria (3.0) and the lowest in Queensland (1.3). The rises and falls in enrolment indices for all states were of a magnitude of less than one percentage point. Enrolments in Japanese were the strongest in all states of Australia, particularly in the Northern Territory (3.3 per cent), ACT (3.4 per cent), Tasmania (4.5 per cent) and Queensland (4.9 percent).

In the Technology Key Learning Area, technical studies and computer studies have both seen a great increase in enrolments across all states of Australia. In Queensland and the Northern Territory the enrolment index has more than doubled, from 3.3 in 1993 to 7.0 in 1998 for Queensland and from 0.8 in 1993 to 2.3 in 1998 for the Northern Territory. There have also been large increases in levels of enrolments in Western Australia (3.9 to 8.2) and Tasmania (4.7 to 8.3).

Table 16 Enrolments[a] for Year 12 in subject areas by location

Key Learning Area	Subject Area	Capital city	Other city	Rural area
English	English	18.8	18.7	18.2
Mathematics	Mathematics	17.9	17.2	17.6
Society & Environment	Humanities/Social Sciences	9.2	7.7	8.6
	Economics & Business	10.5	7.5	7.6
	Religion/Past Care	2.2	1.8	1.8
		21.9	17	18
Science	Biological/Other Sciences	7.2	8.9	8.3
	Phys Sciences	7.6	7.2	7.3
		14.8	16.1	15.6
Arts	Arts	6.5	7.2	6.2
LOTE	Languages	2.5	0.8	1.1
Technology	Technical Studies	4.5	6.8	6.3
	Computer Studies	5.0	5.8	5.6
	Home Science	2.1	2.5	2.9
	Agriculture	0.1	0.8	1.5
		11.7	15.9	16.3
Health & Physical Education	Physical Education	3.1	4.2	3.8
	Health	1.5	1.5	2.0
		4.6	5.7	5.8
Not Classified/Other		1.2	1.5	1.1

a as measured by the enrolment index

While levels of enrolments in computer studies have increased nationwide, these increases are not of the same magnitude as those in technical studies subjects. The highest levels of enrolments are in Tasmania (7.7), and the lowest in South Australia (3.8). Home science has increased levels of enrolments in Tasmania, making it the highest level in Australia, while studies in physical education have the highest enrolments in Victoria, the Australian Capital Territory and the Northern Territory (6.3), the lowest in New South Wales (0.9).

Locality Differences

Table 16 records the enrolment index values between students according to whether the area in which they live is classed as capital city, other regional city, or rural areas (country towns and other country locations). Overall, none of the differences in enrolment indices are particularly large. For English, mathematics, the physical sciences and the Arts, the range of enrolment index values was particularly small. For economics and business studies, humanities and the social sciences and Languages other than English, enrolments were higher in the capital cities, while in biological and other sciences, technical studies, computer studies and physical education, the highest enrolments are in "other city" areas. In the areas of health, home science and agriculture, students from other country areas are more frequently enrolled.

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INTERACTIVE INFLUENCES

The analysis in the previous section of this report has described the associations of a range of characteristics of students and their schools with subject area enrolments. Analysis in this section of the report will examine the extent to which two or more of these background factors might interact in their influence on subject choice. For example, if location was associated with level of enrolment in science, was this association different for males or females.

Clearly it is not possible to analyse all of the two-way interactions that are possible with the background variables used in this report, let alone the three-way or four-way interactions. While it is possible in principle to do this we are limited by sample size. For example each time an analysis is conducted separately for males and females, the cell sizes are halved in comparison to the total population and the accuracy of estimates is correspondingly reduced. The selection of the interactions in this section of the report deals with those that are related most closely to national equity programs and for which reasonable reliable estimates can be made. The factors considered include gender, social and ethnic background, and earlier school achievement.

The analysis of subject enrolment patterns in the previous section of this report, as well as in previous reports, found persistent gender differences in enrolments. Indeed it was concluded that gender, along with earlier school achievement and state, was one of the major factors associated with subject choice at Year 12. In this section of the report, analyses are presented which examine whether the influence of other factors was the same for males and females.

Interactions of Gender with Socioeconomic Background

Table 17 records the subject area enrolments by socioeconomic status separately for males and females. While there were few differences in subject enrolment patterns between males and females, some small interaction effects were noted.

- Enrolments of female students in humanities and social sciences was more strongly associated with socioeconomic background than for males;
- Enrolments in economics and business were negatively associated with socioeconomic background for females, while there was little association for males;
- There was little association between enrolments in biological and other sciences and socioeconomic background for males, and a generally positive association for females;
- The relationship between subject enrolments in the Arts was slightly negative for males, and slightly positive for females;
- There was quite a strong negative association between enrolments in technical studies and socioeconomic background for males, but little association for females.

Table 17 Enrolments[a] in subject areas in 1998 by parents' socioeconomic background and gender

Key Learning Area	Subject Area	Males				Females			
		Lwr	Lwr mid	Upr mid	Upr	Lwr	Lwr mid	Upr mid	Upr
English	English	17.7	18.1	18.4	18.1	19.2	19.7	20.4	20.2
Mathematics	Mathematics	18.2	17.8	18.8	20.0	16.2	16.4	15.5	17.4
Society and Environment	Human/Soc Sci	7.3	7.7	9.6	8.9	9.4	9.1	11.6	11.7
	Eco & Business	9.3	8.8	9.6	9.7	11.6	9.9	8.8	8.1
	Religion	1.7	1.8	2.2	2.5	1.8	2.3	2.4	3.1
		18.3	18.3	21.4	21.1	22.8	21.3	22.8	22.9
Science	Biol/other Sci	6.7	7.2	6.7	5.9	9.6	10.4	11.3	9.7
	Phys Sciences	7.4	6.9	9.6	13.5	3.1	4.7	6.3	9.1
		14.1	14.1	16.3	19.4	12.7	15.1	17.6	18.8
Arts	Arts	5.5	6.0	5.2	4.2	7.1	9.3	9.5	7.8
LOTE	Languages	1.0	0.6	1.6	2.9	3.0	2.6	3.0	3.1
Technology	Tech Studies	8.3	8.3	5.2	4.3	2.0	1.8	0.9	1.7
	Computer Studies	6.8	6.6	6.2	4.8	5.2	3.1	2.6	2.0
	Home Science	1.5	1.8	1.0	0.7	4.6	4.8	2.7	1.8
	Agriculture	0.8	1.0	0.2	0.3	0.6	0.2	0.1	0.1
		17.4	17.7	12.6	10.1	12.4	9.9	6.3	5.6
Health & Physical Education	Physical Ed	4.6	4.6	3.8	2.3	2.2	2.3	2.0	1.7
	Health	1.5	1.4	1.2	0.9	2.8	2.2	2.2	1.9
		6.1	6	5	3.2	5	4.5	4.2	3.6
Not Classified/ Other		1.8	1.5	0.8	0.9	1.4	1.3	0.9	0.7

a as measured by the enrolment index

Interactions of Gender with Earlier Achievement

In the previous section it was noted that earlier school achievement in literacy and numeracy was strongly associated with subject choice, particularly for the physical sciences. The data recorded in Table 18 show that the association between earlier school achievement and enrolments in mathematics and the physical sciences is positive for both males and females, although the average level of enrolments in these areas is very much lower for females than males. For example at the lower levels of achievement, there are twice the numbers of males enrolled in the physical sciences than females, while at the highest level of achievement, there are 50 per cent more males enrolled than females.

In the biological and other sciences, there was evidence of a negative association for males between enrolment levels and achievement, with the highest levels of participation being for those students in the middle two achievement levels. For females, the opposite was true, and the highest levels of participation can be seen for students in the higher quartiles of achievement.

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Table 18 Enrolments[a] in subject areas in 1998 by achievement quartiles and gender

Key Learning Area	Subject Area	Males				Females			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
English	English	17.8	18.2	18.2	18.3	19.9	19.5	19.8	19.8
Mathematics	Mathematics	16.1	17.0	18.4	20.7	14.0	14.1	16.8	18.0
Society and Environment	Human/Soc Sci	8.0	7.3	8.7	8.5	8.0	10.3	10.5	10.6
	Eco & Business	8.0	9.3	9.5	9.5	10.7	10.9	10.3	8.0
	Relig/Past Care	1.9	2.1	1.9	1.9	2.2	1.9	2.2	2.4
		17.9	18.7	20.1	19.9	20.9	23.1	23.0	21.0
Science	Biol/ Other Sci	6.8	7.4	7.5	5.4	8.3	10.1	10.9	10.2
	Phys Sciences	2.4	4.3	8.2	14.9	1.2	2.1	4.8	10.3
		9.2	11.7	15.7	20.3	9.5	12.2	15.7	20.5
Arts	Arts	5.8	6.3	5.8	4.6	9.3	10.2	8.7	8.0
LOTE	Languages	0.9	0.8	1.1	2.2	2.8	2.8	2.6	3.6
Technology	Tech Studies	11.0	9.5	6.1	3.7	3.0	2.5	1.2	0.9
	Computer Studies	7.4	6.9	6.3	5.0	5.4	3.9	3.6	1.9
	Home Science	3.5	1.7	1.1	0.8	8.2	5.3	3.2	1.6
	Agriculture	1.1	0.8	0.8	0.2	0.2	0.2	0.1	0.4
		23.0	18.9	14.3	9.7	16.8	11.9	8.1	4.8
Health & Physical Education	Physical Ed	6.0	5.2	3.9	2.4	2.6	2.3	2.1	1.8
	Health	1.5	1.5	1.2	1.1	2.5	3.0	2.2	1.7
		7.5	6.7	5.1	3.5	5.1	5.3	4.3	3.5
Not Classified/ Other		1.9	1.8	1.3	0.8	1.9	1.4	1.0	0.6

a as measured by the enrolment index

For the Arts, there are more females than males enrolled at every level of achievement, although the pattern of enrolments is very similar. In the Technology Key Learning Area, it is clear from Table 18 that it is males in the lowest two achievement quartiles that are the main participants in both technical and computer studies, and females in the lowest two achievement quartiles who provide the majority of enrolments in home sciences.

While there was a positive association between enrolments in Languages and earlier school achievement for both males and females, however there was a much greater proportion of females enrolled at any level than males.

Interaction of Gender with School System

The previous section of this report indicated that there were some differences in enrolment patterns for students in the three different school systems; government, Catholic and independent. Because of the differences in the characteristics of these school systems, it is helpful to investigate whether the effects were the same for males and females.

Table 19 Enrolments[a] in subject areas in 1998 by school sector and gender

Key Learning Area	Subject Area	Males			Females		
		Govt	Cath	Indept	Govt	Cath	Indept
English	English	18.3	17.9	18.0	20.0	18.7	20.4
Mathematics	Mathematics	18.3	17.9	19.6	16.2	16.2	15.5
Society and Environment	Human/Soc Sci	8.0	7.9	9.3	10.0	9.1	12.2
	Eco & Business	8.5	10.4	9.8	10.0	9.4	8.7
	Religion	0.3	7.2	1.2	0.4	7.7	1.4
		16.8	25.5	20.3	20.4	26.2	22.3
Science	Biol/ Other Sci	6.7	6.5	6.6	10.0	10.5	9.8
	Phys Sciences	8.0	7.7	11.4	4.6	5.5	8.4
		14.7	14.2	18.0	14.6	16	18.2
Arts	Arts	5.7	5.1	5.5	9.7	6.9	8.8
LOTE	Languages	0.8	1.7	3.0	2.5	3.4	4.8
Technology	Tech Studies	8.5	4.6	4.5	2.0	1.2	1.3
	Computer Studies	6.8	5.5	4.7	3.8	3.3	1.7
	Home Science	2.1	1.0	0.5	4.5	3.1	2.9
	Agriculture	0.8	0.6	0.2	0.3	0.1	0.0
		18.2	11.7	9.9	10.6	7.7	5.9
Health & Physical Education	Physical Ed	4.5	3.1	3.6	2.2	2.2	1.9
	Health	1.4	1.1	1.1	2.5	1.8	1.5
		5.9	4.2	4.7	4.7	4	3.4
Not Classified/ Other		1.3	1.8	1.0	1.2	1.1	0.6

a as measured by the enrolment index

Table 19 shows enrolments in each subject area separately for males and females within each of the school systems. These data indicate that there are a few effects of school system on enrolment patterns for males and females in some subject areas.

There is a greater proportion of males than females enrolled in Mathematics in each of the school systems. While there are more males enrolled in Mathematics in independent schools than in the other two systems, the opposite is true for females. More females are enrolled in Mathematics subjects in government schools than in either Catholic or independent schools. The question that must be asked of this finding is at what levels of mathematics are these students enrolled? In Mathematics, unlike any other curriculum area, there is a range of subjects representing different levels of skill, from the broadly based "mathematics in society" type subjects to the more focussed courses containing calculus. Further investigation of this outcome is warranted. In the physical sciences however, enrolment levels were highest for both males and females in independent schools. For males the participation rate was higher for government than Catholic schools, and for females the participation rate was higher for Catholic schools than government schools.

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Table 20 Enrolments[a] in subject areas in 1998 by home location and gender

Key Learning Area	Subject Area	Males			Females		
		Capital city	Other city	Rural area	Capital city	Other city	Rural area
English	English	18.3	18.2	17.6	19.9	19.6	19.4
Mathematics	Mathematics	18.8	17.8	18.0	16.1	15.9	16.7
Society and Environment	Human/Soc Sci	8.7	7.0	7.9	10.5	9.1	10.1
	Eco & Business	10.5	7.2	7.1	10.7	8.0	8.8
	Religion	2.2	1.5	1.7	2.2	2.4	2.0
		21.4	15.7	16.7	23.4	19.5	20.9
Science	Biol/ Other Sci	6.0	7.9	7.2	9.7	10.8	10.6
	Physical Sciences	8.8	7.8	8.6	5.2	6.0	4.7
		14.8	15.7	15.8	14.9	16.8	15.3
Arts	Arts	5.5	5.9	5.2	8.8	9.7	8.4
LOTE	Languages	2.0	0.3	0.3	3.5	1.8	2.7
Technology	Technical Studies	5.7	9.3	8.4	1.7	1.8	1.8
	Computer Studies	5.8	7.0	6.4	3.2	3.5	4.0
	Home Science	1.5	1.4	2.2	3.6	4.6	4.5
	Agriculture	0.1	1.1	1.8	0.1	0.3	0.8
		13.1	18.8	18.8	8.6	10.2	11.1
Health & Physical Education	Physical Education	3.6	4.9	4.6	1.9	2.8	2.2
	Health	1.3	1.1	1.7	2.0	2.4	2.6
		4.9	6	6.3	3.9	5.2	4.8
Not Classified/ Other		1.3	1.6	1.2	1.1	1.4	0.9

a as measured by the enrolment index

In the humanities and social sciences area, enrolment patterns were the same for males and females in the different school systems. The highest level of enrolments was in independent schools, and participation rates for males and females were slightly higher in government schools than Catholic schools. While the variations are not large, there are slightly different patterns of enrolment between males and females in the economics and business subject area. Among males, enrolments in this area were higher at non-government schools than government schools, whereas for females enrolments were higher at government schools than non-government schools. It is likely that this reflects differences within the subject areas chosen by males and females.

Interaction of Gender with Home Location

Enrolment levels in each subject area by gender and home location are shown in Table 20. The effects of home location on enrolments was found in the last section to be generally quite small, and the data in this Table can be characterised as showing little interaction effect between home location and gender.

The exceptions to this were in mathematics and the physical sciences. These differences are also shown in Figure 8. In mathematics, the highest proportion of enrolments was found to be in capital cities for males, while for females it was students from rural areas. The largest differences between enrolment levels in mathematics can be seen to be in capital cities, the smallest difference in rural areas.

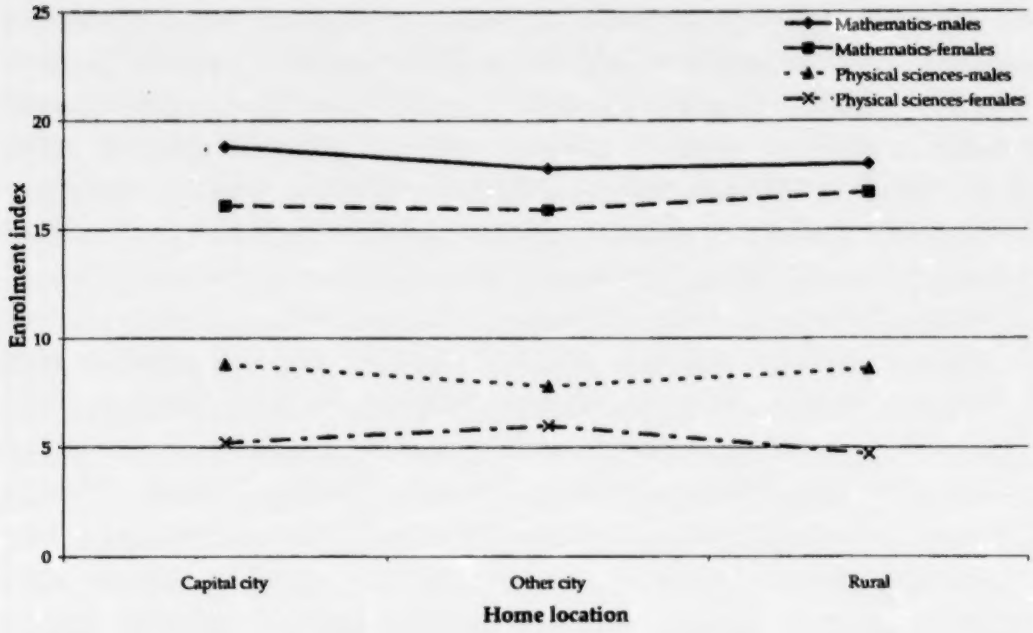

Figure 8 Participation in mathematics and physical sciences by home location and gender

In the physical sciences, male participation was again highest (however only barely) in capital cities, while for females the highest level of participation was in other city areas. In this case the greatest differences in participation between males and females can be seen to be in rural areas. It should be noted, however, that females in each area participate in these subjects at a lower rate than males, and that the differences between enrolment levels for each particular subject area is not great.

Interactions of Gender with Non-English Speaking Background

Table 21 provides data on enrolment levels for each of the subject areas by gender and non-English speaking background, in this instance measured by parental birthplace. In the previous section of this report it has been noted that, compared to other students, those from a non-English speaking background tended to have higher enrolments in mathematics, the physical sciences and Languages other than English, but lower levels of enrolments in the humanities, the biological and other sciences, and physical education.

Table 21 does not indicate the presence of any substantial interaction effects involving gender and non-English speaking background. In mathematics and the physical sciences, the higher enrolment levels for students from a non-English speaking background were evident for both males and females (although smaller effects can be noted for females). A similar pattern was noted for economics and business and Languages other than English. Lower enrolment levels in the humanities and social sciences, biological and other sciences and physical education were noted for students from a non-English speaking background for both males and females.

Table 21 Enrolments[a] in subject areas in 1998 by parental birthplace and gender

Key Learning Area	Subject Area	Males		Females	
		Aust/Eng	Non-Eng	Aust/Eng	Non-Eng
English	English	18.1	18.3	19.9	19.4
Mathematics	Mathematics	18.1	19.6	16.1	16.7
Society and Environment	Human/Soc Sci	8.4	7.7	10.6	8.9
	Eco & Business	8.6	11.5	8.3	14.5
	Religion/Past Care	1.7	2.7	2.0	3.0
		18.7	21.9	20.9	26.4
Science	Biological/ Other Sci	7.0	5.6	10.4	9.1
	Phys Sciences	8.2	9.9	5.2	5.7
		15.2	15.5	15.6	14.8
Arts	Arts	5.5	5.2	9.6	5.8
LOTE	Languages	0.9	2.7	2.4	4.7
Technology	Tech Studies	7.5	5.0	1.7	1.8
	Computer Studies	6.3	6.1	3.5	3.3
	Home Science	1.7	1.2	4.2	2.9
	Agriculture	0.8	0.1	0.3	0.0
		16.3	12.4	9.7	8
Health & Physical Education	Phys Ed	4.7	1.9	2.4	1.2
	Health	1.4	1.0	2.3	1.9
		6.1	2.9	4.7	3.1
Not Classified/ Other		1.4	1.2	1.1	1.1

a as measured by the enrolment index

The only interaction effect that can be seen in these data concerns technical studies. Males of a non-English speaking background had lower levels of enrolment in technical studies, where for females, where enrolments are very small anyway, there were no differences associated with non-English speaking background.

VOCATIONAL EDUCATION AND TRAINING IN SCHOOLS

A National Perspective

As part of this survey, students were asked two questions that directly addressed participation in Vocational Education and Training (VET) courses. Students were asked to answer yes or no to the questions:

- During 1998, as part of your schooling, have you done, or are you doing, study at a TAFE or TAFE subjects at school? And
- This year have you done, or are you doing, any non-TAFE VET subjects or courses at school, that is, Vocational Education and Training?

Table 22 Background characteristics by VET participation status

	VET	No VET
Gender	%	%
Male	16.5	83.5
Female	15.3	84.7
School type		
Government	18.1	81.9
Catholic	15.9	84.1
Independent	6.7	93.3
Socioeconomic background		
High	8.7	91.3
High/Middle	11.3	88.7
Low/Middle	18.7	81.3
Low	19.3	80.7
Parents' educational level		
Higher education	9.1	90.9
Completed secondary school	17.9	82.1
Middle secondary school	19.0	81.0
Overall achievement		
Lowest	25.1	74.9
Second	21.1	78.9
Third	13.2	86.8
Highest	8.2	91.8
Home language		
English	16.2	83.8
Non-English	13.6	86.4
Parents' birthplace		
Australia/English speaking country	17.3	82.7
Non-English speaking country	10.2	89.8
Location		
Capital city	13.5	86.5
Other city	17.5	82.5
Rural area	21.2	78.8

Students were coded as VET participants if they answered yes to *either* of these questions. For this data collection then, students self-identified as participating in VET programs and it was assumed that subjects would be recognised by students as being VET. There may, however, be studies that are taken by students that they see as being "normal" Year 12 subjects which may be able to be done as VET studies, however these are unable to be identified in the current data collection. There is most likely a higher proportion of Year 11 students than Year 12 students undertaking VET subjects (Ainley & Fleming, 1997). VET studies have expanded to cover a wide range of subjects, including business management and education, graphic communication, physical education, computer studies, food technology, early childhood studies, materials and technology, automotive technology, and tourism.

On the basis of this survey it is estimated that approximately 16 per cent (ie one in six) of Year 12 students in Australia include VET studies as part of their program. Table 22 provides some background information for those students participating in VET studies compared to those without any VET subjects in their course of study. A slightly greater proportion of males than females include VET units in their Year 12 studies, and the highest numbers of these students are in government schools, where there is about three times the proportion of enrolments as there are in independent schools. Students from a low socioeconomic background were more than twice as likely as those from a high socioeconomic background to be undertaking VET studies as part of their Year 12 course (19.3 per cent compared to 8.7 per cent). Similarly, students whose parents did not complete secondary school were more than twice as likely than those whose parents completed tertiary studies to be enrolled in VET subjects. For students from a higher socioeconomic background and students whose parents have completed tertiary studies, enrolments in subject areas leading to tertiary studies and the professions have been shown to be more substantial than for the other groups. The finding that participation in VET subjects is lower in both of these groups of students is complementary to this. Students with less well educated parents or with parents in lower skilled jobs were more likely to see access to employment opportunities to be enhanced by VET studies at secondary school.

Early school achievement levels were also a strong predictor of participation in VET, with students from the lowest achievement quartile being more than three times more likely as those from the highest achievement quartile to include VET subjects. Again, the students with the higher achievement levels were those more likely to be enrolled in subjects leading to tertiary studies and professions.

Students from a non-English speaking background, as measured both by parents' birthplace and by home language, were less likely to be enrolled in VET subjects, reflecting their greater levels of enrolment in mathematics, physical sciences, and economics and business studies. Enrolments in rural areas were in general substantially higher than enrolments in capital city areas, perhaps reflecting greater opportunities for participation in rural areas.

Subject Area by Participation in VET

Table 23 shows the relationship between level of enrolments in the range of subject areas and participation in VET. Students enrolled in VET units are less likely to be enrolled in mathematics, humanities and social sciences, Languages other than English, and the biological sciences, and only about one-quarter as likely to study subjects in the physical sciences. This is consistent with previous findings; those that participate in VET are most likely to be in the lowest achievement quartiles, and those in the lowest achievement quartiles are least likely to be studying the physical sciences.

The area in which enrolments by VET students outstrip those of other students is of course in the Key Learning Area of Technology. In technical studies, home sciences and agriculture in particular, enrolments by the VET group are more than twice that of the non-VET group.

Table 23 Enrolments[a] in Year 12 in subject area by participation in VET

Key Learning Area	Subject Area	VET	Non-VET
English	English	18.0	18.8
Mathematics	Mathematics	16.1	17.4
Society & Environment	Human/Social Sciences	6.1	9.5
	Economics & Business	10.2	9.4
	Religion/Pastoral Care	2.0	2.2
		18.3	21.1
Science	Biological/Other Sciences	6.2	8.9
	Physical Sciences	1.9	7.3
		8.1	16.2
Arts	Arts	7.3	7.2
LOTE	Languages	0.9	2.2
Technology	Technical Studies	8.0	3.5
	Computer Studies	6.2	4.6
	Home Science	6.8	2.7
	Agriculture	0.8	0.4
		21.8	11.2
Health & Physical Education	Physical Education	4.1	3.1
	Health	1.8	2.0
		5.9	5.1
Not Classified/Other		3.7	0.8

a as measured by the enrolment index

SUMMARY

Previous reports indicated that more than 80 per cent of enrolments were in the seven broad categories of English, mathematics, humanities and social sciences, economics and business, biological and physical sciences, and the arts. In the current study, these subjects still account for some 75 per cent of subject enrolments, with an increasing share being taken up by technical studies and computer studies (enrolment index of 5.3 for each, an increase from 3.6 and 3.7 respectively from 1993). In all other subject areas other than English, enrolments have decreased since 1993.

English enrolments make up almost 19 per cent of enrolments, mathematics about 18 per cent, humanities and social sciences and economics and business about 9 per cent each, each of the Sciences, biological and physical, around 7.5 per cent, and 6.6 per cent in the Arts.

There is a range of students and school characteristics that are potential influences on subject choice at Year 12. Three of the most important influences were the students' state of residence, their gender, and their earlier school achievement in literacy and numeracy. This current finding is similar to those of previous studies. There were state differences in all subject areas, particularly evident in those with the larger enrolment levels, and in particular in English, mathematics and humanities and social sciences. These differences are presumably due to differences between the states in rules about

compulsory subjects and subject selection, the range of subjects that are offered in each of the states, and the particular curriculum foci that are specific to each of the states.

Gender is one of the student characteristics that accounts for the greatest proportion of variation in student enrolments. Males predominate, as they have done in the 1990 and 1993 studies, in mathematics, physical sciences, technical studies, computer studies and physical education. Females predominate in the areas of English, humanities and social sciences, biological sciences, the arts, Languages other than English, home sciences, and to a lesser extent, health studies.

Participation in VET is strongly associated with student and school characteristics. In terms of students' background characteristics, VET participation is greater among those students from lower socioeconomic status backgrounds, who had lower levels of earlier school achievement and who were of English speaking background. It was also greater among students from government and Catholic schools than independent schools, and in rural schools.

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